AbstractID: 13502 Title: Intensity-modulated radiotherapy planning characteristics of celiac deep-seated tumor

Objective: To examine the influence of energy and number of beams for intensity-modulated radiation therapy on celiac deep-seated tumor.

Methods and Materials: 26 patients with cancer of pancreas were studied. Their IMRT plans were created for 6MV and 15MV photons using 5, 7, 9 and 11 coplanar non-opposed fields. Plans were normalized to cover no less than 95% of the target volume at the 100% prescribed dose and were analyzed using two factor ANOVA with repetition and broken line graph for (a) dose distribution on PTV, (b) conformity index at prescribed dose for PTV, (c) dose on the organs at risk(OAR), (d) dose distribution on the region around the target which were divided into "near region"(NR: 1-cm thick shell surrounding target), "surface region"(SR: 1cm thick shell under the surface) and "middle region"(MR: the region except NR and SR).

Result: Dose distribution on PTV and OAR were the same for all the eight different plans; CI for all the other six plans had no significant deviations except the two 5-beams plans which had less CI; Plans with the same number of beams but lower beam energy would enlarge the MR and SR volume significantly; Plans with 7 or 9 beams showed the better characteristics with the same energy.

Conclusion: With IMRT for the celiac deep-seated tumor, plans with 6MV and 15MV photons had no significant deviations on target and OAR, although the lower energy would enlarge the dose volume on MR and SR. The clinical significance of this increased dose , in terms of complications, remains to be detected. Considering the disadvantages of using the higher energy including higher secondary radiation dose to the patient and staff, increased non-equilibrium effects and larger penumbra, the plan with 6MV photon and 7 beams should be considered first.